SHARP

PLEASE READ THIS MANUAL CAREFULLY BEFORE INSTALLING OR USING THE MODULES.
PLEASE PASS ALONG THE ATTACHED USER MANUAL TO YOUR CUSTOMER.

Ver. 8.0E

INSTALLATION MANUAL
– Crystalline Photovoltaic Module –

MODEL

ND-R240A2, ND-R235A2, ND-R230A2, ND-R225A2, ND-R220A2, ND-R215A2, ND-R210A2, ND-235R1J, ND-230R1J, ND-225R1J, ND-220R1J, ND-215R1J, ND-210R1J, NU-R250J5, NU-R245J5, NU-R240J5, NU-235R1H, NU-230R1H, NU-225R1H, NU-220R1H, NU-185R1H, NU-180R1H, NU-175R1H

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PLEASE READ THIS MANUAL CAREFULLY BEFORE USING THE MODULES

IMPORTANT SAFETY INSTRUCTIONS

This manual contains important safety instructions for the PV module that must be followed during the maintenance of PV modules.
To reduce the risk of electric shock, do not perform any servicing unless you are qualified to do so.

1. The installation must be performed by a certified installer /servicer to ensure system integrity and safety.
2. The installation is only allowed after referring and understanding of GENERAL INSTALLATION MANUAL and INSTALLATION MANUAL -PHOTOVOLTAIC MODULE-. If you don't have your personal copy, please contact your installer or local Sharp office listed in Sharp Solar web site : URL : http://www.sharp-world.com/solar
3. Do not pull the PV cables.
4. Do not touch any surface of module.
5. Do not place/drop objects onto the PV modules.
6. Do not disassemble or attempt to repair the PV module by yourself.
7. Do not drop the PV module.
8. Do not damage, pull, bend, or place heavy material on cables.
9. Upon completion of any service or repairs, ask the installer/servicer to perform routine checks to determine that the PV modules are in safe and proper operating condition.
10. When replacement parts are required, be sure the installer/servicer uses parts specified by the manufacturer with same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazard.
11. Consult your local building and safety department for required permits and applicable regulations.

CAUTION: HIGH VOLTAGE
To reduce the risk of electric shock, do not touch.

PŘED POUŽITÍM MODULŮ SI POZORNĚ PŘEČTĚTE TUTO PŘÍRUČKU

CZ

DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY

V této příručce jsou uvedeny důležité bezpečnostní pokyny týkající se PV-modulu, které musíte dodržovat při jeho údržbě. Abyste snížili nebezpečí úrazu elektrickým proudem, neprovádějte žádné servisní opravy, pokud k nim nemáte dostatečnou kvalifikaci.

1. Instalaci musí provést kvalifikovaný montér nebo servisní pracovník, který zajistí integritu a bezpečnost systému.
2. Před instalací je nutno přečíst si a pochopit OBECNÝ NÁVOD K INSTALACI a NÁVOD K INSTALACI FOTOVOLTAICKÉHO MODULU. Pokud nemáte svůj vlastní výtisk, obraťte se laskavě na montéra nebo místní pobočku společnosti Sharp, která je uvedena na webové stránce Sharp Solar : URL : http://www.sharp-world.com/solar
3. Nevytahujte PV-kabely.
4. edotýkejte se nikde povrchu modulu.
5. Na PV-moduly nesmíte pokládat ani upustit žádné předměty.
6. Nerozebírejte a nepokoušejte se opravovat PV-modul sami.
7. Dávejte pozor, abyste PV-modul nepustili.
8. Nepoškozujte, nenahejte, neohýbejte kabely, ani je nezatěžujte těžkými předměty.
9. Po dokončení každé údržby nebo opravy požádejte montéra nebo servisního pracovníka, aby provedl běžnou kontrolu a ujistil se, že PV-moduly jsou v bezpečném a řádném provozním stavu.
10. Pokud je nutná výměna náhradních dílů, ujistěte se, že montér nebo servisní pracovník používá výhradně díly specifikované výrobcem, které mají stejné parametry jako originální díly. Neschválené výměny mohou způsobit požár, úraz elektrickým proudem nebo jiné nebezpečí.
11. Pro potřebná povolení a příslušné směrnice se obraťte na místní stavební a bezpečnostní odbor.

POZOR: VYSOKÉ NAPĚTÍ
Nedotýkejte se, abyste snížili nebezpečí úrazu elektrickým proudem.

LESEN SIE VOR VERWENDUNG DIESES MODULS DIE ANLEITUNG BITTE AUFMERKSAM DURCH **DE**

WICHTIGE SICHERHEITSHINWEISE

Diese Anleitung enthält wichtige Sicherheitshinweise für das PV-Modul, die während der Wartung der PV-Module beachtet werden müssen. Nehmen Sie keine Servicearbeiten vor, wenn Sie keine ausreichenden Kenntnisse dafür haben; andernfalls besteht die Gefahr eines elektrischen Schlages.

1. Die Installation muss von einem zertifizierten Installateur/Servicemitarbeiter vorgenommen werden, um zu gewährleisten, dass das System intakt und sicher ist.
2. Vor der Installation müssen die ALLGEMEINE INSTALLATIONSANLEITUNG und die INSTALLATIONSANLEITUNG – PHOTOVOLTAIK-MODULE gelesen werden; achten Sie darauf, dass Sie alle Informationen verstanden haben. Sollten sie keine Ausgabe dieser Anleitungen haben, wenden Sie sich an Ihren Händler oder einen Sharp-Händler in Ihrer Nähe; auf der Sharp-Solar-Website mit der URL: http://www.sharp-world.com/solar finden Sie ein Verzeichnis mit Sharp-Händlern.
3. Ziehen Sie nicht an den PV-Kabeln.
4. Berühren Sie die Oberfläche der Module nicht.
5. Stellen Sie keine Objekte auf die PV-Module.
6. Bauen Sie das PV-Modul nicht auseinander. Versuchen Sie auch nicht, es selbst zu reparieren.
7. Lassen Sie das PV-Modul nicht fallen.
8. Beschädigen Sie das Kabel nicht; ziehen Sie nicht daran und verbiegen Sie es nicht. Stellen Sie auch keine schweren Gegenstände darauf.
9. Fragen Sie nach Beendigung jeglicher Service- oder Reparaturarbeiten Ihren Installateur/Servicemitarbeiter, Routineüberprüfungen durchzuführen, um sicherzustellen, dass sich die PV-Module in einem sicheren und ordnungsgemäßen Zustand befinden.
10. Wenn Sie Ersatzteile benötigen, achten Sie darauf, dass der Installateur/Servicemitarbeiter Teile verwendet, die vom Hersteller mit denselben Eigenschaften versehen wurden, wie die Originalteile. Nicht autorisierte Ersatzteile können Feuer, einen elektrischen Schlag oder weitere Gefahren verursachen.
11. Wenden Sie sich an Ihre lokale Baubehörde, um zu erfahren, welche erforderlichen Genehmigungen und Vorschriften einzuhalten sind.

VORSICHT: HOCHSPANNUNG
Nicht berühren! Andernfalls könnte es zu einem elektrischen Schlag kommen!

LÆS VENLIGST BRUGSVEJLEDNINGEN GRUNDIGT, INDEN MODULERNE BRUGES **DK**

VIGTIGE SIKKERHEDSINSTRUKTIONER

Denne manual indeholder vigtige sikkerhedsinstruktioner for PV modulet, der skal følges under vedligeholdelse af PV moduler. For at reducere risikoen for elektrisk stød må du ikke udføre nogen form for service, medmindre du har kvalifikationerne til det.

1. Installationen skal foretages af en autoriseret elektriker for at sikre systemets integritet og sikkerhed.
2. Installationen er kun tilladt efter at have læst og forstået DEN GENERELLE INSTALLATIONSMANUAL og INSTALLATIONSMANUALEN -PHOTOVOLTAISK MODUL-. Hvis du ikke har din personlige kopi, bedes du kontakte din installatør eller det lokale Sharp kontor, der er oplistet på Sharp Solar hjemmesiden : URL : http://www.sharp-world.com/solar
3. Træk ikke PV kablerne.Undlad at berøre modulets overflade.
4. Undlad at berøre modulets overflade.
5. Undlad at sætte/lægge genstande på PV modulerne.
6. Undlad at demontere eller forsøge at reparere PV modulet selv.
7. Undlad at tabe PV modulet.
8. Undlad at ødelægge, trække eller bøje kablerne eller placere tunge genstande på dem.
9. Efter udførelse af service eller reparation skal du bede installatøren/elektrikeren foretage rutinekontrol for at se, om PV modulerne er i sikker og korrekt funktionsbetingelse.
10. Når der er brug for udskiftningsdele skal du sørge for, at elektrikeren/installatøren anvender de dele, der er specificeret af producenten, med samme karakteristika som de originale dele. Uautoriserede reservedele kan resultere i brand, elektrisk stød eller andre farer.
11. Konsulter den lokale bygge- og sikkerhedsafdeling for de krævede godkendelser og gældende regulativer.

FORSIGTIG: HØJSPÆNDING
Undlad berøring for at reducere risikoen for elektrisk stød.

LEA ESTE MANUAL CUIDADOSAMENTE ANTES DE USAR LOS MÓDULOS **ES**

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este manual contiene instrucciones importantes de seguridad para el modulo FV que deben seguirse durante el mantenimiento de los módulos. Para reducir el riesgo de descargas eléctricas, no realice ningún servicio a menos de que esté cualificado para hacerlo.

1. La instalación debe realizarla un instalador/técnico certificado para asegurar la integridad del sistema y la seguridad.
2. Se permite la instalación después de haber consultado y entendido el MANUAL GENERAL DE INSTALACIÓN y el MANUAL DE INSTALACIÓN -MÓDULO FOTOVOLTAICO-. Si no cuenta con su copia personal, contacte a su instalador u oficina local Sharp listada en el sitio web de Sharp Solar : URL : http://www.sharp-world.com/solar
3. No tire de los cables FV.
4. No toque ninguna superficie del módulo.
5. No coloque/arroje objetos sobre los módulos FV.
6. No desarme o intente reparar el módulo FV usted mismo.
7. No arroje el módulo FV.
8. No dañe, jale, tuerza, o coloque materiales pesados sobre los cables.
9. Una vez terminado el servicio de mantenimiento o la reparación, pida al instalador/técnico que realice chequeos rutinarios para determinar que los módulos FV están en condiciones seguras y adecuadas para operar.
10. Cuando se requieran piezas de reemplazo, asegúrese de que el instalador/técnico utilice piezas especificadas por el fabricante con las mismas características que las piezas originales. Los reemplazos no autorizados podrían resultar en incendios, descargas eléctricas u otros riesgos peligrosos.
11. Consulte con las oficinas y departamentos de seguridad de su localidad para los permisos requeridos y regulaciones aplicables.

PRECAUCIÓN: ALTO VOLTAJE
Para reducir el riesgo de descargas eléctricas no toque.

LUE TÄMÄ KÄYTTÖOHJE HUOLELLISESTI ENNEN PANEELIEN KÄYTTÖÄ **FI**

TÄRKEITÄ TURVALLISUUSOHJEITA

Tässä ohjeessa on tärkeitä aurinkosähköpaneelia koskevia turvallisuusohjeita, joita pitää noudattaa paneelien huollon aikana. Sähköiskun vaaran välttämiseksi älä tee mitään huoltotoimenpiteitä, ellei sinulla ole valtuuksia siihen.

1. Tuotteen saa asentaa vain valtuutettu asentaja/huoltohenkilö, jotta järjestelmän toimivuus ja turvallisuus voidaan varmistaa.
2. Laitetta saa käyttää vasta sitten, kun laitetta käyttävä henkilö on lukenut ja ymmärtänyt dokumentit YLEINEN ASENNUSOHJE sekä ASENNUSOHJE -AURINKOSÄHKÖPANEELI-. Jos sinulla ei ole kyseisiä ohjeita, ota yhteyttä laitteen asentajaan tai paikalliseen Sharp-toimistoon, jonka löydät Sharp Solar -verkkosivuilta : URL : http://www.sharp-world.com/solar
3. Älä vedä aurinkosähköpaneelin johdoista.
4. Älä kosketa mihinkään paneelin pintaan.
5. Älä aseta/pudota esineitä paneelien päälle.
6. Älä pura tai yritä korjata paneelia itse.
7. Älä pudota paneelia.
8. Älä vahingoita, vedä tai taivuta johtoja tai pane niiden päälle painavia esineitä.
9. Kun laitetta on huollettu tai korjattu, pyydä asentajaa/huoltohenkilöä suorittamaan rutiinitarkastukset, joiden avulla voidaan määrittää, ovatko aurinkosähköpaneelit turvallisessa ja toimivassa käyttökunnossa.
10. Jos tarvitset varaosia, varmista, että asentaja/huoltohenkilö käyttää valmistajan määrittämiä osia, jotka vastaavat alkuperäisosia. Vääränlaisten osien käyttö voi aiheuttaa tulipalon, sähköiskun tai muita vaaroja.
11. Tiedustele paikallisesta rakennusvirastosta, tarvitaanko laitteen käyttöä varten käyttölupia tai liittyykö laitteen käyttöön joitakin määräyksiä.

VAROITUS: KORKEAJÄNNITE
Vältä sähköiskuja, älä koske.

VEUILLER LIRE CE MANUEL AVEC ATTENTION AVANT L'UTILISATION DES MODULES **FR**

INSTRUCTIONS IMPORTANTES DE SECURITE

Ce manuel contient d'importantes instructions de sécurité concernant le module et qui doivent être respectées lors de l'entretien des modules photovoltaïques.
Afin de réduire les risques de chocs électriques, veuillez n'effectuer aucune intervention à moins d'être qualifié pour le faire.

1. L'installation doit être réalisée par un manutentionnaire ou une assistance certifié(e) qui puisse assurer l'intégrité et la sécurité du système.
2. L'installation est seulement autorisée après la bonne compréhension et application du MANUEL D'INSTALLATION GENERAL et du MANUEL D'INSTALLATION -MODULES PHOTOVOLTAIQUES-. Si vous ne possédez pas de copie personnelle, veuillez contacter votre manutentionnaire ou assistance au bureau Sharp local recensé sur le site Web Sharp : URL : http://www.sharp-world.com/solar
3. Ne pas tirer les câbles photovoltaïques.
4. Ne toucher aucune surface du module.
5. Ne pas placer ni jeter d'objets sur les modules photovoltaïques.
6. Ne pas démonter ou tenter de réparer des modules photovoltaïques par vous-même.
7. Ne pas jeter de module photovoltaïque.
8. Ne pas endommager, tirer, plier ou placer de matériels lourds sur les câbles.
9. Suite à la réalisation de n'importe quelle intervention ou réparation, demander au manutentionnaire ou à l'assistance d'effectuer des contrôles de routine afin de s'assurer que les modules photovoltaïques sont sûrs et en parfait état de fonctionnement.
10. Lorsqu'il est nécessaire de remplacer des pièces, assurez-vous que le manutentionnaire ou l'assistance utilise bien des pièces spécifiques venant de la manufacture avec les mêmes caractéristiques que les pièces originales. Utiliser des pièces de remplacements interdites risquerait de causer un incendie, un choc électrique ou tout autre danger.
11. Consultez votre établissement local et département de sécurité pour obtenir les permis requis et autres régulations nécessaires.

ATTENTION : HAUT VOLTAGE
Ne pas toucher afin de réduire les risques de choc électrique.

ΠΑΡΑΚΑΛΟΥΜΕ ΔΙΑΒΑΣΤΕ ΠΡΟΣΕΚΤΙΚΑ ΑΥΤΟ ΤΟ ΕΓΧΕΙΡΙΔΙΟ ΠΡΟΤΟΥ ΧΡΗΣΙΜΟΠΟΙΗΣΕΤΕ ΤΙΣ ΜΟΝΑΔΕΣ **GR**

ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

Αυτό το εγχειρίδιο περιέχει σημαντικές για τη φωτοβολταϊκή μονάδα, οι οποίες πρέπει να τηρούνται κατά τη διάρκεια της συντήρησης των μονάδων.
Για να αποφευχθεί ο κίνδυνος ηλεκτροπληξίας, μην πραγματοποιήσετε κανενός είδους συντήρηση αν δεν έχετε την κατάλληλη εξειδίκευση.

1. Η εγκατάσταση θα πρέπει να πραγματοποιηθεί από πιστοποιημένο ειδικό εγκατάστασης/συντήρησης για τη διασφάλιση της ακεραιότητας και ασφάλειας του συστήματος.
2. Η εγκατάσταση επιτρέπεται μόνο αφού διαβάσετε και κατανοήσετε το ΓΕΝΙΚΟ ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ και το ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ -ΦΩΤΟΒΟΛΤΑΪΚΗ ΜΟΝΑΔΑ-. Αν δεν έχετε το προσωπικό σας αντίγραφο, παρακαλούμε επικοινωνήστε με τον τεχνίτη εγκατάσταση ή το τοπικό γραφείο της Sharp, από τον κατάλογο που αναφέρεται στην ιστοσελίδα : Διεύθυνση URL : http://www.sharp-world.com/solar
3. Μην τραβάτε τα φωτοβολταϊκά καλώδια.
4. Μην αγγίζετε καμία επιφάνεια της μονάδας.
5. Μην τοποθετείτε/ρίχνετε αντικείμενα πάνω στις φωτοβολταϊκές μονάδες.
6. Μην αποσυναρμολογείτε τη φωτοβολταϊκή μονάδα ούτε να αποπειραθείτε να την επισκευάσετε μόνος σας.
7. Μην αφήσετε να σας πέσει η φωτοβολταϊκή μονάδα.
8. Μην προκαλείτε ζημιές στα καλώδια, ούτε να τα τραβάτε, να τα τσακίζετε ή να τοποθετείτε πάνω τους βαριά υλικά.
9. Κατά την ολοκλήρωση οποιωνδήποτε εργασιών συντήρησης ή επισκευών, ζητήστε από τον ειδικό εγκατάστασης/συντήρησης να πραγματοποιήσει τους συνήθεις ελέγχους έτσι ώστε να διαπιστώσει ότι οι φωτοβολταϊκές μονάδες λειτουργούν σωστά και με ασφάλεια.
10. Όταν απαιτείται η αντικατάσταση εξαρτημάτων, βεβαιωθείτε ότι ο ειδικός εγκατάστασης/συντήρησης χρησιμοποιεί τα εξαρτήματα που ορίζονται από τον κατασκευαστή με χαρακτηριστικά ίδια με τα αυθεντικά εξαρτήματα. Οι μη εξουσιοδοτημένες αντικαταστάσεις μπορούν να οδηγήσουν σε πυρκαγιά, ηλεκτροπληξία και άλλους κινδύνους.
11. Συμβουλευτείτε το τοπικό σας τμήμα εγκαταστάσεων και ασφάλειας για τις απαιτούμενες άδειες και τις ισχύουσες κανονισμούς.

ΠΡΟΣΟΧΗ: ΥΨΗΛΗ ΤΑΣΗ
Μην αγγίζετε, κίνδυνος ηλεκτροπληξίας.

LÉIGH AN LEABHRÁN SEO GO CÚRAMACH LE DO THOIL ROIMH NA MODÚIL SEO A ÚSÁID **IE**

TREORACHA SÁBHÁILTEACHTA TÁBHACHTACHA

Soláthraítear treoracha sábháilteachta tábhachtacha sa lámhleabhar seo don mhodúl fótavoltach. Caithfear na treoracha seo a leanúint nuair a dhéantar obair cothabhála ar na modúil.
Chun an riosca turrainge leictreach a laghdú, ná déan iarracht aon obair cothabhála a dhéanamh gan cáilíochtaí a bheith agat.

1. Caithfear teicneoir suiteála/duine cothabhála deimhnithe a úsáid chun na modúil a shuiteáil chun deimhin a dhéanamh de go gcomhlíonfar sláine agus sábháilteacht an chórais.
2. Ní ceart na modúil a shuiteáil ach amháin nuair a bheidh an LÁMHLEABHAR SUITEÁLA GINEARÁLTA agus an LÁMHLEABHAR SUITEÁLA -MODÚL FÓTAVOLTACH- léite agus tuigthe agat. Muna mbíonn do chóip phearsanta féin agat, déan teagmháil le do theicneoir suiteála nó le h-oifig áitiúil Sharp liostaithe ar an láithreán gréasáin Sharp Solar : Suíomh Gréasáin : http://www.sharp-world.com/solar
3. Ná tarraing na cáblaí fótavoltacha.
4. Ná leag lámh ar aon chuid de dhromchla an mhodúil.
5. Ná cuir/ná lig do rudaí titim ar na modúil fótavoltacha.
6. Ná díchóimeáil nó ná déan iarracht an modúl fótavoltach a dheisiú tú féin.
7. Ná lig don mhodúl fótavoltach titim.
8. Ná scrios, ná tarraing, ná lúb, nó ná leag ábhar trom ar na cáblaí.
9. Agus seirbhís éigin nó deisiúcháin déanta, iarr ar an innealtóir suiteála/duine cothabhála gnáthscrúdaithe a dhéanamh chun a chinntiú go bhfuil na modúil fótavoltacha ag feidhmiú i gceart agus go sábháilte.
10. Nuair a bhíonn páirteanna nua ag teastáil, déan deimhin de go n-úsáideann an teicneoir suiteála/duine cothabhála páirteanna sonraithe ag an déantóir leis na sonraí céanna is a bhí ag na páirteanna bunúsacha. Muna n-úsáidtear na páirteanna cearta tá baol ann go dtarlódh tine, turrainge leictreach nó guais eile.
11. Téigh i gcomhairle le do roinn tógála sábhála áitiúil chun teacht ar na ceadúnais riachtanacha agus ar na rialacháin iomchuí.

AIRE: ARDVOLTAS
Chun an riosca turrainge leictreach a laghdú, ná leag lámh ar seo.

SI PREGA DI LEGGERE ATTENTAMENTE IL PRESENTE MANUALE PRIMA DI UTILIZZARE I MODULI **IT**

IMPORTANTI ISTRUZIONI DI SICUREZZA

Il presente manuale contiene importanti istruzioni di sicurezza per i moduli fotovoltaici, che devono essere seguite attentamente quando si utilizzano questi moduli.
Al fine di ridurre il rischio di scosse elettriche, non eseguire alcuna operazione di manutenzione o riparazione, a meno che non si possiedano le competenze necessarie.

1. L'installazione deve essere eseguita da un addetto all'installazione/manutenzione qualificato, per garantire l'integrità e la sicurezza del sistema.
2. È possibile eseguire l'installazione solo dopo aver letto e compreso il MANUALE GENERALE D'INSTALLAZIONE e il MANUALE D'INSTALLAZIONE -MODULO FOTOVOLTAICO-. In caso l'utente non sia in possesso di una copia dei suddetti manuali, si prega di rivolgersi al proprio addetto all'installazione o al punto vendita Sharp più vicino, indicato al sito Internet Sharp Solar: URL : http://www.sharp-world.com/solar
3. Non tirare i cavi del modulo fotovoltaico.
4. Non toccare alcuna superficie del modulo.
5. Non posizionare/lasciar cadere oggetti sul modulo fotovoltaico. Non smontare né tentare di riparare il modulo fotovoltaico senza l'assistenza di un tecnico qualificato.
6. Non lasciar cadere il modulo fotovoltaico.
7. Non danneggiare, tirare, piegare né posizionare materiali pesanti sui cavi.
8. Al termine delle operazioni di manutenzione o riparazione, chiedere all'addetto all'installazione/manutenzione di eseguire i controlli di routine per stabilire che i moduli fotovoltaici siano in perfette condizioni di funzionamento.
9. In caso di necessità di pezzi di ricambio, assicurarsi che l'addetto all'installazione/manutenzione utilizzi i pezzi di ricambio indicati dal fabbricante, con le stesse caratteristiche dei pezzi originali. Sostituzioni non autorizzate potrebbero provocare incendi, scosse elettriche o altre situazioni pericolose.
10. Rivolgersi all'ufficio locale responsabile per la sicurezza e l'edilizia per quanto riguarda i permessi necessari e le relative disposizioni.
11. Rivolgersi all'ufficio locale responsabile per la sicurezza e l'edilizia per quanto riguarda i permessi necessari e le relative disposizioni.

ATTENZIONE: ALTA TENSIONE
Al fine di ridurre il rischio di scosse elettriche, non toccare.

JEKK JOGĦĠBOK AQRA DAN IL-MANWAL B'ATTENZJONI QABEL TUŻA L-MODULI **MT**

STRUZZJONIJIET IMPORTANTI FUQ IS-SIGURTÀ

Dan il-manwal fih struzzjonijiet importanti fuq is-sigurtà għall-modulu PV li għandhom jiġu segwiti matul il-manutenzjoni tal-moduli PV. Sabiex jitnaqqas ir-riskju ta' xokk elettriku, ma għandekx tagħmel xogħol ta' manutenzjoni sakemm ma tkunx ikkwalifikat biex tagħmel dan.

1. L-installazzjoni għandha ssir minn installatur/persuna li tagħmel xogħol ta' manutenzjoni ċċertifikata sabiex tiġi żgurata l-integrità u s-sigurtà tas-sistema.
2. L-installazzjoni hija permessa biss wara referenza għal u fehim tal-MANWAL ĠENERALI TA' L-INSTALLAZZJONI u l-MANWAL TA' L-INSTALLAZZJONI -MODULU FOTOVOLTAJKU-. Jekk ma għandekx il-kopja personali tiegħek, jekk jogħġbok ikkuntattja lill-installatur tiegħek jew lill-uffiċċju lokali ta' Sharp tiegħek elenkat fil-website ta' Sharp Solar : URL : http://www.sharp-world.com/solar
3. Tiġbidx il-kejbils tal-PV.
4. Tmiss ebda wiċċ tal-modulu.
5. Tpoġġix/twaqqax oġġetti fuq il-moduli PV.
6. Tgħaqqadx jew tipprovax issewwi l-modulu PV inti stess.
7. Twaqqax il-modulu PV.
8. Tagħmilx ħsara, tiġbidx, tilwix jew tpoġġix materjali tqal fuq il-kejbils.
9. Malli jitlesta xi xogħol ta' servis jew tiswija, itlob lill-installatur/persuna li tagħmel xogħol ta' manutenzjoni biex tagħmel kontrolli ta' rutina sabiex jiġi stabbilit jekk il-moduli PV humiex sikuri u humiex qegħdin jaħdmu tajjeb.
10. Meta jkunu meħtieġa partijiet ta' sostituzzjoni, kun żgur li l-installatur/persuna li tagħmel xogħol ta' manutenzjoni tuża partijiet speċifikati mill-fabbrikant bl-istess karatteristiċi tal-partijiet oriġinali. Partijiet li m'humiex originali jistgħu jagħtu lok għal nar, xokk elettriku, jew xi periklu ieħor.
11. Ikkonsulta mad-dipartiment tal-bini u tas-sigurtà lokali tiegħek għall-permessi meħtieġa u regolamenti applikabbli.

ATTENZJONI: VULTAĠĠ GĦOLI
Biex tnaqqas ir-riskju ta' xokk elettriku, tmissx.

LEES DEZE HANDLEIDING ZORGVULDIG ALVORENS DE MODULES TE GEBRUIKEN **NL**

BELANGRIJKE VEILIGHEIDSVOORSCHRIFTEN

Deze handleiding bevat belangrijke veiligheidsvoorschriften voor de FV module die moeten worden gevolgd tijdens het onderhoud van de FV modules.
Om het risico op een elektrische schok te beperken, mag u geen onderhoud uitvoeren tenzij u daartoe bevoegd bent.

1. De installatie moet worden uitgevoerd door een erkende installateur/onderhoudstechnicus om de integriteit en de veiligheid van het systeem te waarborgen.
2. De installatie is alleen toegestaan nadat de ALGEMENE INSTALLATIEHANDLEIDING en de INSTALLATIEHANDLEIDING -FOTOVOLTAÏSCHE MODULE- is gelezen en begrepen. Indien u niet over een eigen exemplaar beschikt, neem dan contact op met uw installateur of plaatselijke Sharp-kantoor. De lijst van kantoren vindt u op de Sharp Solar website : URL: http://www.sharp-world.com/solar
3. Trek niet aan de FV kabels.
4. Raak geen oppervlakken van de module aan.
5. Plaats geen voorwerpen of laat geen voorwerpen vallen op de FV modules.
6. Probeer de FV module niet zelf te demonteren of te repareren.
7. Laat de FV module niet vallen.
8. Let op dat u de kabels niet beschadigt, eraan trekt, buigt of er zware voorwerpen op plaatst.
9. Vraag na het voltooien van onderhoud of reparaties aan de installateur/onderhoudstechnicus om routinecontroles uit te voeren om te bepalen of de FV modules veilig zijn en goed functioneren.
10. Wanneer vervangingsonderdelen nodig zijn, zorg er dan voor dat de installateur/onderhoudstechnicus door de fabrikant voorgeschreven onderdelen gebruikt met dezelfde eigenschappen als de originele onderdelen. Niet-goedgekeurde vervangingen kunnen brand, een elektrisch schok of andere gevaren veroorzaken.
11. Raadpleeg uw plaatselijke bouw- en veiligheidsdienst voor de vereiste vergunningen en de geldende voorschriften.

OPGELET: HOOGSPANNING
Niet aanraken, gevaar voor een elektrische schok.

VENNLIGST LES DENNE HÅNDBOKEN NØYE FØR DU BRUKER MODULENE **NO**

VIKTIGE SIKKERHETSINSTRUKSER

Denne håndboken inneholder viktige sikkerhetsinstrukser for PV-modulen som må følges under vedlikeholdet av PV-modulene.
For å redusere faren for elektrisk støt, må du ikke utføre noen service med mindre du er kvalifisert til dette.

1. Installasjonen må utføres av en sertifisert installatør/servicetekniker, for å sikre systemintegritet og sikkerhet.
2. Installasjonen må bare utføres etter at man har lest og forstått den GENERELLE INSTALLASJONSHÅNDBOKEN og INSTALLASJONSHÅNDBOK –FOTOELEKTRISK MODUL. Hvis du ikke har noen egen kopi, ta kontakt med installatøren eller din lokale Sharp-forhandler som du finner på Sharp Solar nettsted med adresse: http://www.sharp-world.com/solar
3. Ikke trekk i PV-kablene.
4. Ikke berør noen av overflatene på modulen.
5. Ikke plasser/mist noen gjenstander på PV-modulene.
6. Ikke demonter eller forsøk å reparere PV-modulen på egenhånd.
7. Ikke mist PV-modulen.
8. Ikke skad, trekk, bøy eller plasser tunge gjenstander på kablene.
9. Ved fullføring av eventuell service eller reparasjon, be installatøren/serviceteknikeren om å utføre rutinekontroller for å fastslå om PV-modulene er i sikker og trygg driftstilstand.
10. Når det er behov for erstatningsdeler, pass på at installatøren/serviceteknikeren bruker deler som er spesifisert av produsenten, med samme karakteristika som originaldeler. Uautoriserte erstatninger kan forårsake brann, elektrisk støt eller annen fare.
11. Ta kontakt med det lokale bygningsrådet for nødvendige tillatelser og egnede forskrifter.

ADVARSEL: HØYSPENNING
For å redusere faren for elektrisk støt, ikke rør.

PROSZĘ UWAŻNIE PRZECZYTAĆ TĄ INSTRUKCJĘ PRZED ROZPOCZĘCIEM KORZYSTANIA Z MODUŁÓW **PL**

WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

Niniejsza instrukcja zawiera ważne instrukcje dotyczące bezpieczeństwa modułu fotowoltaicznego, których należy przestrzegać podczas konserwacji i użytkowania modułów.
Aby zmniejszyć ryzyko porażenia prądem, nie przeprowadzaj napraw ani serwisowania, jeśli nie masz do tego odpowiednich kwalifikacji.

1. Instalacji musi dokonać certyfikowany monter/pracownik serwisu, aby zagwarantować bezpieczeństwo i poprawną instalację systemu.
2. Instalację można rozpocząć dopiero po uważnym przeczytaniu OGÓLNEJ INSTRUKCJI INSTALACJI oraz INSTRUKCJI UŻYTKOWNIKA –MODUŁ FOTOWOLTAICZNY-. Jeśli nie masz własnej kopii, skontaktuj się z monterem lub lokalnym przedstawicielem Sharp podanym na stronie internetowej : http://www.sharp-world.com/solar
3. Nie ciągnij za kable modułu fotowoltaicznego.
4. Nie dotykaj żadnych powierzchni modułu.
5. Nie stawiaj, ani nie upuszczaj żadnych przedmiotów na moduły.
6. Nie demontuj ani nie próbuj samodzielnie naprawiać modułu fotowoltaicznego.
7. Uważaj, aby nie upuścić modułu.
8. Nie uszkodź, nie zginaj, nie ciągnij kabli, ani nie stawiaj na nich ciężkich przedmiotów.
9. Po zakończeniu serwisowania lub naprawy, poproś montera/serwisanta o przeprowadzenie rutynowych kontroli, aby sprawdzić czy moduły fotowoltaiczne są w dobrym stanie używalności.
10. Jeśli potrzebne są części zamienne, dopilnuj by monter/serwisant stosował części podane przez producenta o tej samej charakterystyce, co części oryginalne. Nieuprawnione wymiany mogą prowadzić do pożaru, porażenia prądem lub innych zagrożeń.
11. Skonsultuj się z lokalnym urzędem zajmującym się budownictwem i bezpieczeństwem instalacji, aby uzyskać wymagane zezwolenia i odpowiednie przepisy.

UWAGA: WYSOKIE NAPIĘCIE
Nie dotykaj, aby uniknąć ryzyka porażenia prądem.

LEIA CUIDADOSAMENTE ESTE MANUAL ANTES DE USAR OS MÓDULOS **PT**

INSTRUÇÕES DE SEGURANÇA IMPORTANTES

Este manual contém importantes instruções de segurança para o módulo FV que deverão ser respeitadas durante a manutenção dos módulos FV.
Para reduzir o risco de choque eléctrico, não execute nenhum serviço a não ser que esteja qualificado para tal.

1. A instalação deve ser executada por um instalador/técnico certificado para assegurar a integridade e a segurança do sistema.
2. A instalação só é permitida após consulta e compreensão do MANUAL DE INSTALAÇÃO GERAL e MANUAL DE INSTALAÇÃO -MÓDULO FOTOVOLTAICO-. Se não possuir a sua cópia, contacte o seu instalador ou os serviços Sharp locais listados no site Sharp Solar : URL : http://www.sharp-world.com/solar
3. Não puxe os cabos FV.
4. Não toque em nenhuma superfície do módulo.
5. Não coloque/deixe cair objectos sobre os módulos FV.
6. Não desmonte nem tente reparar por si próprio o módulo FV.
7. Não deixe cair o módulo FV.
8. Não danifique, puxe, dobre nem coloque material pesado sobre os cabos.
9. Ao completar qualquer serviço ou reparação, peça ao instalador/técnico que execute verificações de rotina para determinar se os módulos FV estão em condições de operação correcta e segura.
10. Quando forem necessárias peças de substituição, assegure-se de que o instalador/técnico utiliza as peças especificadas pelo fabricante com as mesmas características das peças originais. Substituições não autorizadas poderão resultar em ogo, choque eléctrico ou outros perigos.
11. Consulte os organismos de construção e segurança locais para obter as autorizações necessárias e regulamentos aplicáveis.

ATENÇÃO: ALTA TENSÃO
Para reduzir o risco de choque eléctrico, não toque.

PRED POUŽITÍM MODULOV SI POZORNE PREČÍTAJTE TÚTO PRÍRUČKU **SK**

DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY

Táto príručka obsahuje dôležité bezpečnostné pokyny pre PV modul, ktoré sa musia dodržiavať pri jeho údržbe.
Aby ste znížili riziko úrazu elektrickým šokom, nevykonávajte žiadne servisné práce, iba v prípade, že ste na to kvalifikovaný.

1. Inštaláciu musí vykonať kvalifikovaný inštalatér alebo servisný pracovník, aby sa zaistila integrita a bezpečnosť systému.
2. Inštalácia je povolená len po prečítaní a porozumení obsahu PRÍRUČKY VŠEOBECNEJ INŠTALÁCIE a INŠTALAČNEJ PRÍRUČKY FOTOVOLTAICKÉHO MODULU. Ak neváte svoju vlastnú kópiu, kontaktujte inštalatéra alebo miestne zastúpenie spoločnosti Sharp, ktorej adresa je uvedená na webovej stránke Sharp Solar: URL: http://www.sharp-world.com/solar
3. Nevyťahujte káble PV modulu.
4. Nedotýkajte sa žiadneho povrchu modulu. Neukladajte na PV moduly predmety, ani nedovoľte, aby na ne spadli predmety.
5. Nepokúšajte sa rozmontovať alebo sami opraviť PV modul.
6. Nenechajte PV modul spadnúť.
7. Nepoškoďte, neťahajte, neohýbajte alebo neukladajte ťažké predmety na káble.
8. Po dokončení akejkoľvek opravy požiadajte inštalatéra alebo servisného technika o prevedenie bežnej kontroly na potvrdenie toho, že PV moduly sú v bezpečnom a správnom prevádzkovom stave.
9. Ak sú potrebné náhradné diely, uistite sa, že inštalatér alebo servisný technik používa náhradné diely špecifikované výrobcom, ktoré majú rovnaké vlastnosti ako pôvodné súčiastky.
10. Nesprávne náhradné diely môžu spôsobiť požiar, úraz elektrickým prúdom alebo iné nebezpečenstvo.
11. Poraďte sa s miestnym stavebným a bezpečnostným úradom ohľadom požadovaných povolení a príslušných nariadeniach.

POZOR: VYSOKÉ NAPÄTIE
Nedotýkajte sa, aby ste predišli úrazu elektrickým šokom.

PROSIMO, DA PRED UPORABO MODULOV POZORNO PREBERETE TA PRIROČNIK **SI**

POMEMBNA VARNOSTNA NAVODILA

Ta priročnik vsebuje pomembna varnostna navodila za PV modul, katerim je med vzdrževanjem PV modulov potrebno slediti.
Za zmanjšanje nevarnosti električnega udara ne izvajajte nobenega servisnega posega, edino, v primeru, da ste zanj ustrezno usposobljeni.

1. Namestitev mora izvesti pooblaščeni inštalater/serviser, saj sta le tako zagotovljeni integriteta in varnost sistema.
2. Namestitev je dovoljena le, ko popolnoma preučite in razumete SPLOŠNA NAVODILA ZA NAMESTITEV in PRIROČNIK ZA NAMESTITEV –FOTOVOLTAIČNI MODUL-. Če še nimate svojega lastnega izvoda, se prosimo obrnite na vašega inštalaterja ali obiščite lokalno pisarno Sharp, navedeno na spletni strani Sharp Solar: URL : http://www.sharp-world.com/solar
3. Ne vlecite PV kablov.
4. Ne dotikajte se površine modula.
5. Ne postavljajte/odlagajte predmetov na PV module.
6. Sami ne razstavljajte niti se ne lotevajte popravila PV modula.
7. PV modula ne odlagajte naglo.
8. Ne poškodujte, vlecite, zvijajte niti ne polagajte težkih predmetov na kable.
9. Zaradi popolnega servisiranja ali popravila, inštalaterja/serviserja prosite za opravljanje rutinskih pregledov, preko katerih boste imeli stalen nadzor nad varnim in brezhibnim delovanjem PV modulov.
10. Kadar je potrebno zamenjati določene dele, poskrbite, da bo inštalater/serviser uporabil zgolj predpisane dele z enakimi lastnostmi, kot jih imajo originalni. Neodobreni nadomestni deli lahko povzročijo požar, električni udar ali drugo tveganje.
11. Za zahtevana dovoljenja in ustrezne uredbe se obrnite na lokalni urad za varnost.

SVARILO: VISOKA NAPETOST
Nevarnost električnega udara. Naprave se ne dotikajte.

VAR VÄNLIG LÄS DENNA BRUKSANVISNING NOGGRANT INNAN DU ANVÄNDER MODULERNA **SE**

VIKTIGA SÄKERHETSFÖRESKRIFTER

Denna bruksanvisning innehåller viktiga säkerhetsföreskrifter för PV-modulen som måste efterföljas vid underhåll av PV-moduler.
För att minska risken för elstötar ska du inte genomföra några underhållsåtgärder på egen hand såvida du inte är tvungen.

1. Installationen måste genomföras av en certifierad installatör/tekniker för att garantera systemets integritet och säkerhet.
2. Installationen är endast tillåten efter att ALLMÄN BRUKSANVISNING och BRUKSANVISNING - FOTOELEKTROMOTORISK MODUL- har lästs och förståtts. Om du inte har din egen kopia, bör du kontakta din installatör eller lokala Sharp-kontor som finns på Sharp Solar-webbsidan : URL : http://www.sharp-world.com/solar
3. Dra inte i PV-kablarna.
4. Vidrör inte ytan på modulen.
5. Undvik att placera/tappa föremål på PV-modulerna.
6. Plocka inte isär eller försök reparera PV-modulen på egen hand.
7. Tappa inte PV-modulen.
8. Undvika att skada, dra i, böja eller placera tunga föremål på kablarna.
9. Efter underhåll och reparationer, ska du be installatören/teknikern att genomföra en rutinkontroll för att se till att PV-modulerna är i säkert och ordentligt bruksskick.
10. När reservdelar behövs, ska du se till att installatören/teknikern använder delar som anges av tillverkaren med samma egenskaper som originaldelarna. Icke-auktoriserade reservdelar kan orsaka brand, elstötar eller annan fara.
11. Rådfråga din lokala byggnads- och säkerhetsavdelning för nödvändiga tillstånd och gällande regler.

VARNING: HÖG SPÄNNING
Vidrör ej, för att minska risken för elstöt.

LÜTFEN MODÜLLERİ KULLANMADAN ÖNCE BU KULLANIM KILAVUZUNU DİKKATLİ BİR BİÇİMDE OKUYUNUZ

TR

ÖNEMLİ GÜVENLİK TALİMATLARI

Bu kullanım kılavuzu, PV modülü için PV modüllerinin bakımı esnasında uyulması önemli güvenlik talimatlarını içerir.
Elektrik çarpması riskini azaltmak için, gerekli yetkiye sahip olmadığınız takdirde hiçbir servis işlemini yapmayınız.

1. Sistemin bütünlüğünü ve güvenliğini sağlamak için kurulumun belgeli bir kurulum/servis personeli tarafından gerçekleştirilmesi gerekir.
2. Kuruluma ancak GENEL KURULUM KILAVUZUNA ve KURULUM KILAVUZUNA –FOTOVOLTAJ MODÜLÜNE başvurulup, bunlar anlaşıldıktan sonra izin verilebilir. Kendi kişisel kopyanız yoksa lütfen kurulum personelinize veya Sharp Solar web sitesinde kayıtlı bulunan yerel Sharp ofisine başvurunuz : URL : http://www.sharp-world.com/solar
3. PV kablolarını çekmeyiniz.
4. Modülün hiçbir yüzeyine dokunmayınız.
5. PV modüllerine hiçbir nesne yerleştirmeyiniz/düşürmeyiniz.
6. PV modülünü parçalarına ayırmayınız veya kendiniz onarmaya çalışmayınız.
7. PV modülünü düşürmeyiniz.
8. Kablolara zarar vermeyiniz, bunları çekmeyiniz, bükmeyiniz veya üzerlerine ağır malzemeler yerleştirmeyiniz.
9. Herhangi bir bakım veya onarım tamamlandıktan sonra, PV modüllerinin güvenli olup olmadığını ve doğru bir şekilde çalışıp çalışmadığını kontrol etmek için kurulum/servis personelinden rutin kontrolleri yapmasını rica ediniz.
10. Yedek parça gerektiğinde, kurulum/servis personelinin, üretici tarafından belirtilen ve orijinal parçayla aynı özelliklere sahip yedek parçaları kullandığından emin olunuz. Yetkili olmayan bir değiştirme, yangına, elektrik çarpmasına veya benzeri başka tehlikelere neden olabilir.
11. Gerekli izinler ve geçerli yönetmelikler için yerel bina ve güvenlik departmanınıza başvurunuz.

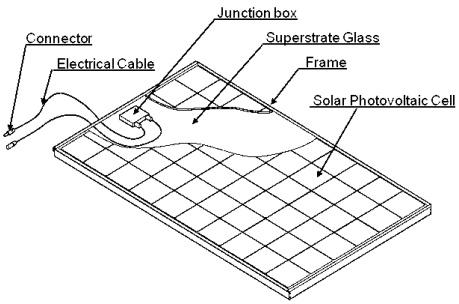
DİKKAT: YÜKSEK VOLTAJ
Elektrik çarpması riskini azaltmak için dokunmayınız.

GENERAL INSTRUCTIONS

1. INTRODUCTION

This Installation Manual contains essential information for the electrical and mechanical installation that you must know before installing SHARP PV modules. This also contains safety information you need to be familiar with. All the information described in this manual are the intellectual property of SHARP and based on the technologies and experiences that have been acquired and accumulated in the long history of SHARP. This document does not constitute a guaranty, expressed or implied. SHARP does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with installation, operation, use or maintenance of the PV modules. No responsibility is assumed by SHARP for any infringement of patents or other rights of third parties that may result from use of PV module. SHARP reserves the right to make changes to the product, specifications or installation manual without prior notice.

2. COMPONENTS



3. GENERAL INFORMATION (INCLUDING WARNING AND SAFETY)

The installation of PV modules requires a great degree of skill and should only be performed by a qualified licensed professional, including licensed contractors and licensed electricians. Please be aware that there is a serious risk of various types of injury occurring during the installation including the risk of electric shock. All SHARP PV modules are equipped with a permanently attached terminal box that will accept variety of wiring applications or with a special cable assembly for ease of installation, and they do not require special assembly.

< GENERAL WARNING >

1. PV modules are heavy. Handle with care.
2. Before you attempt to install, wire, operate and maintain the PV module, please make sure that you completely understand the information described in this installation manual.
3. Contact with electrically active parts of a PV module such as terminals can result in burns, sparks and lethal shock whether the PV modules is connected or not.
4. PV modules produce electricity when the sufficient sunlight or other sources illuminate the module surface. When the modules are connected in series, voltage is cumulative. When the modules are connected in parallel, current is cumulative. As a result, a large-scale PV system can produce high voltage and current which could present an increased hazard and may cause serious injury or death.
5. Do not connect the PV modules directly to the loads such as motor since the variation of the output power depending on the solar irradiation causes damage for the connected motor.
   1: In the case of a brushless motor, the lock function becomes active and the hall IC is most likely to be damaged.
   2: In the case of a brush type motor, the coil is most likely to be damaged.
6. In case of snow build-up, snow would slide easier on the smooth surface of the module than other parts of the roof. Snow may suddenly slide, fall off the roof and hit nearby objects/areas. Take preventive measures (e.g. snow stopper) when there is possible risk such case would cause an injury or a damage.

< GENERAL SAFETY >

1. Consult local codes and other applicable laws concerning required permits on regulations concerning installation and inspection requirements.
2. Before installing a PV module, contact appropriate authorities to determine permit, installation and inspection requirements that should be followed.
3. Install PV modules and ground frames in accordance with applicable rules and regulations.
4. PV modules should be installed and maintained by qualified personnel. Only installer/servicer personnel should have access to the PV module installation site.
5. No matter where the PV modules are installed, either roof mounted construction or any other type of structures above the ground, appropriate safety practices should be followed and required safety

equipment should be used in order to avoid possible safety hazards. Note that the installation of some PV modules on roofs may require the addition of fireproofing, depending on local building/fire codes.
6. In the case that the PV modules are non-integral type, the module is to be mounted over a fire resistant roof.
7. Please use PV modules with same cell size within series.
8. Follow all safety precautions of other components used in the system.
9. In order to avoid a risk of injury or electrical shock, do not allow anyone to approach the PV module if the person has little knowledge on PV module or on the measures that should be taken when PV modules are damaged.
10. Do not shade portions of the PV module surface from the sunlight for a long time. The shaded cell may become hot (hot spot phenomenon) which results in solder joints peeling off. Shading causes drop in generated power and/or operation failure of the PV modules.
11. Do not clean the glass surface with chemicals. Do not let water stay on the glass surface of PV modules for a long time. This creates a risk of white efflorescence (glass disease) which may result in the deterioration of energy generation.
12. Do not install the PV module horizontally. It may cause dirt or white efflorescence (glass disease) due to water.
13. Do not cover the water drain gap of the frame. There is a risk of frost damage when the frame is filled with water cumulation.
14. When sliding snow load has to be considered, an appropriate measure has to be taken so that PV module frames on lower edge of PV modules will not be damaged.
15. Do not expose PV module to sunlight concentrated with mirrors, lenses or similar means.
16. Turn off inverters and circuit breakers immediately, should a problem occur.
17. In case the glass surface of a PV module is broken, wear goggles and tape the glass to keep the broken pieces in place.
18. A defective PV module may generate power even if it is removed from the system. It may be dangerous to handle the PV module while exposed to sunlight. Place a defective PV module in a carton so PV cells are completely shaded.
19. In case of series connection, the maximum open circuit voltage must not be greater than the specified maximum system voltage. The voltage is proportional to the number of series. In case of parallel connection, please be sure to take proper measure (e.g. fuse for protection of module and cable from over current, and/or blocking diode for prevention of unbalanced strings voltage) to block the reverse current flow. The current may easily flow in a reverse direction.
20. Keep modules away from children.

< HANDLING SAFETY >

1. Do not cause an excessive load on the surface of PV module or twist the frame. The glass surface can easily break.
2. Do not stand or step on the PV module. The surface glass of PV module is slippery.
3. Do not hit or put excessive load on the glass or back sheet. The PV cell is very thin and can be easily broken.
4. Do not scratch or hit at the back sheet. The back sheet is vulnerable.
5. Do not hit on the terminal box or do not pull the cables. The terminal box can crack and break.
6. Never touch terminal box or the end of output cables with bare hands when the PV module is irradiated. Cover the surface of PV module with cloth or other suitable sufficiently opaque material to isolate the PV module from incident light and handle the wires with rubber-gloved hands to avoid electric shock.
7. Do not scratch the output cable or bend it with force. The insulation of output cable can break and may result in electricity leakage or shock.
8. Do not pull the output cable excessively. The output cable may unplug and cause electricity leakage or shock.
9. Do not drill holes in the frame. It may compromise the frame strength and cause corrosion of the frame.
10. Do not scratch the insulation coating of the frame (except for grounding connection). It may cause corrosion of the frame or compromise the framework strength.
11. Do not loosen or remove the screws of the PV module. It may compromise the joint strength of PV module and cause corrosion.
12. Do not touch the PV module with bare hands. The frame of PV module has sharp edges and may cause injury.
13. Do not drop PV module or allow objects to fall down on the PV module.
14. Do not try artificially to concentrate sunlight on the PV module.
15. Do not grab the PV module at only one side. The frame may bend. Grab the PV module at two sides facing each other.

< INSTALLATION SAFETY >

1. Always wear protective head gear, insulating gloves and safety shoes (with rubber soles).
2. Keep the PV module packed in the carton until installation.
3. Do not touch the PV module unnecessarily during installation. The glass surface and the frames get hot. There is a risk of burn, or you may collapse because of electric shock.
4. Do not work under rain, snow or windy conditions.
5. Use insulated tools.
6. Do not use wet tools.
7. Do not drop tools or hard objects on PV modules
8. When installing PV modules far above ground, do not drop any object (e.g., PV module or tools).
9. Make sure flammable gases are not generated near the installation site.
10. Completely cover the PV module surface with an opaque material during PV module installation and wiring.
11. Plug in the connector tight and ensure the wiring work.
12. Due to the risk of electrical shock, do not perform any work if the terminals of PV module are wet.
13. Do not touch the terminal box and the end of output cables, the cable ends (connectors) , with bare hands during installation or under sunlight, regardless of whether the PV module is connected to or disconnected from the system.
14. Do not unplug the connector if the system circuit is connected to a load.
15. Do not stomp on the glass at work. There is a risk of injury or electric shock if glass is broken.
16. Do not work alone (always work as a team of 2 or more people).
17. Wear a safety belt if working far above the ground.
18. Do not wear metallic jewelry which can cause electric shock during installation.
19. Do not damage the back sheet of PV modules when fastening the PV modules to a support by bolts.
20. Do not damage the surrounding PV modules or mounting structure when replacing a PV module.
21. Bind cables by the insulation locks. Drooping down of cables from the terminal box could possibly cause various problems such as animal biting, electricity leakage in puddle.
22. Take proper measures for preventing the laminate (consisted of resin, cells, glass, back sheet, etc.) from dropping out of the frame in case the glass is broken.
23. Cables shall be located so that they will not be exposed to direct sunlight after installation to prevent degradation of cables.
24. If batteries are used with modules, follow safety precautions of the battery manufacturer.
25. In case of extreme snow build-up, the weight of the snow may cause the module's frame to deform. Take appropriate preventive measures to minimize any possible resulting damage.

4. SITE SELECTION

In most applications, the PV modules should be installed in a location where there is no shading throughout the year. In the Northern Hemisphere, the PV modules should typically face south, and in the Southern Hemisphere, the PV modules should typically face north.
Please make sure that there are no obstructions in the surroundings of the site of installation. Take proper steps in order to maintain reliability and safety, in case the PV modules are used in areas such as: Heavy snow areas / Extremely cold areas / Strong wind areas / Installations over, or near, water / Areas where installations are prone to salt water damage(*) / Small islands or desert areas.
(*) If you are planning to use the PV modules where the salt water damage may be possible, please consult with SHARP local agent first to determine an appropriate installation method, or to determine whether the installation is possible.

5. TILT ANGLE
The tilt angle of the PV module is the measured between the PV module and a horizontal ground surface. The PV module generates the maximum output power when it faces the sun directly.
5 degrees or more is recommended for the tilt angle of the PV module for the maintenance (See 11. Maintenance).
For the standalone systems with a battery where the PV modules are attached to a permanent structure, the tilt angle of the PV modules should be determined to optimize the performance when the sunlight is the scarcest. In general, if the electric power generation is adequate when the sunlight is the scarcest, then the angle chosen should be adequate during the rest of the year. For grid-connected installations where the PV modules are attached to a permanent structure, it is recommended to tilt the PV module at the angle equal to the latitude of the installation site so that the power generation from the PV module will be optimum throughout the year.

6. WIRING
To ensure proper system operation and to maintain your guaranty, observe the correct cable connection polarity (Figures 1 & 2) when connecting the modules to a battery or to other modules. If not connected correctly, the bypass diode could be destroyed.
PV modules can be wired in series to increase voltage. Connect wires from the positive terminal of one module to the negative terminal of the next module. Figure 1 shows modules connected in series.
Connect PV modules in parallel to increase current. Connect wires from the positive terminal of one module to the positive terminal on the next module. Figure 2 shows modules connected in parallel.

Figure 1. SERIES for more voltage

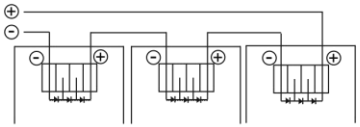
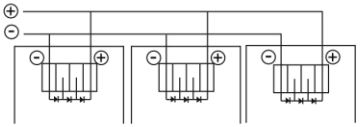


Figure 2. PARALLEL for more current



7. INSTALLATION
Refer to installation manual of PV module.

8. ELECTRICAL RATINGS
Refer to installation manual of PV module.

9. GROUNDING
The frame grounding must consider the local requirement and regulation at the site of installation. When grounding is required, please refer to below example connection (Figure 3). Please be careful in arranging the system ground so that the removal of one module from the circuit will not interrupt the grounding of any other modules.
The modules should be grounded to the same electrical point as described below.

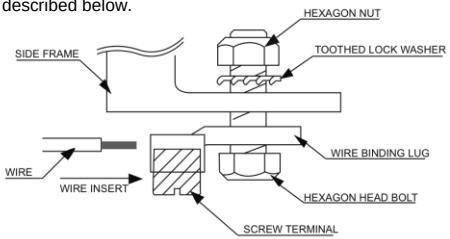


Figure 3. Example of acceptable ground connection

Each PV module has a hole on the side frame for either a bolt, nut and washer grounding the module to the frame, a ground lug fastened by bolt or screw, or appropriate screw (hardware not provided). Near the hole for ground, either " ⏚ " or " G " is indicated as ground symbol. An example of acceptable ground connection using a bolt, nut and washer retaining a ground lug is shown in figure 3. In a connection of this type, the hardware (such as a toothed locked washer / star washer) must score the frame surface to make positive electrical contact with the frame. The ground wire must be considered within the local requirement of local and regulation at the site of installation.

10. MOUNTING
Please make sure that all the information described in the installation manual is still valid and proper for your installation. The mounting method has been verified by SHARP and NOT CERTIFIED by a third party organization.
The approved way to mount Sharp PV modules to a support structure is using the bolt holes provided as described in the Specifications. Although Sharp does not specify or warrant frame clips or clamps, using frame clips (not provided) or clamps (not provided) is also possible when they are designed for PV modules and with minimum dimensions on the sides of the module in accordance with the instructions and drawings provided. If using frame clips or clamps, the modules should be fixed rigidly and there shall be no damage to the modules by deforming mounting structure against design load. The Sharp module guaranty may be void if customer-selected frame clips which are improper or inadequate with respect to the module properties (including strength or material) or installation. Note that if metal clips are used, there must be a path to ground from the clips, (for instance, using star washers in the clip hardware set).
Please review the descriptions and drawings carefully; not mounting the modules according to one of these methods may void your guaranty. These mounting methods are designed to allow module loading of 2400Pa. Support structures that PV modules are mounted on should be rigid. Sharp PV modules are designed to secure their electric performance under the condition that they are mounted on rigid support structures. Deformation of support structure may damage PV module with its electric performance.
When mounting the module on structure, ensure that no corner has a displacement of more than 2mm per every 1000mm of the diagonal.

11. MAINTENANCE
The modules are designed for long life and require very little maintenance. If the angle of the PV module is 5 degrees or more, normal rainfall is sufficient to keep the module glass surface clean under most weather conditions. If dirt build-up becomes excessive, clean the glass surface only with a soft cloth using water. If cleaning the back of the module is required, take utmost care not to damage the back side materials. In order to ensure the operation of the system, please check the connection of wiring and the state of the jacket of wires every now and then.
For PV modules with anti-reflective coating glass (NU-R250J5, NU-R245J5, NU-R240J5), do not touch the glass since finger prints or stains will easily mark the glass. If dirt build-up becomes excessive, clean the glass surface with water only.

ND-R240A2, ND-R235A2, ND-R230A2, ND-R225A2, ND-R220A2, ND-R215A2, ND-R210A2, ND-235R1J, ND-230R1J, ND-225R1J, ND-220R1J, ND-215R1J, ND-210R1J, NU-R250J5, NU-R245J5, NU-R240J5, NU-235R1H, NU-230R1H, NU-225R1H, NU-220R1H

1. INSTALLATION

The mounting method has been verified by SHARP and NOT CERTIFIED by a third party organization. Please review the descriptions and drawings carefully; not mounting the modules according to one of these methods may void your guaranty. These mounting methods are designed to allow module loading of 2400Pa.

Mounting Using Frame Bolt Holes (Figures 1 & 3)

The modules may be fastened to a support using the bolt holes in the bottom of the frames at location "C", as shown in Figure 1 (back view of the module) and Figure 3 (mounting detail). The module should be fastened with four (4) M8 bolts.

Mounting Using Clips on Long Edge of Module:
Long Edge Parallel to Array Rails (Figure 4)

The modules may be mounted using clips (clamps) designed for solar modules as shown in Figures 2 and 4. Note that the clip positions are important – the clip centerlines must be between 150mm and 410mm from the end of the module.
The module must be supported along the length of the long edge, and should overlap the array rail by at least 10mm. Note that the mounting clips should meet the minimum dimensions (catch width of 5mm and length of 38mm) as shown in Figure 2. The array rails must support the bottom of the frames and must be continuous pieces (no breaks in the rail).

Mounting Using Clips on Long Edge of Module:
Long Edge Perpendicular to Array Rails (Figure 5)

The modules may also be mounted using clips on the long sides of the module when the array rails are perpendicular to the long sides, as shown in Figure 5. The clip centerlines must be between 150mm and 410mm from the ends of the module. Note that the mounting clips should meet the minimum dimensions (catch width of 5mm and length of 38mm) shown in Figure 2. The array rails must support the bottom of the frames and must be continuous pieces (no breaks in the rail).

2. ELECTRICAL INSTALLATION INSTRUCTION

Cable characteristics

Conductor size: 4.0mm^2, Cable type: XLPE cable (CE cable)
Maximum DC voltage: 1.8kV
Ambient temperature: -40°C to +90°C,
Maximum conductor temperature: 120 °C

Module configuration (Recommend)

Maximum series configuration: please refer to Table 1 (This value is calculated under the condition of Voc at -40 °C.)
Maximum parallel configuration: (Parallel connection of each string shall be conducted with following two options. Any other parallel connections are prohibited.)
a) Case of using the diodes; 1 diode per maximum 2 parallel strings (Connect a diode or more in series for every string or every 2 parallel strings for protection of module from reverse current over load.)
b) Case of using the fuses; 1 fuse per every string (Connect a fuse for every single string for protection of module from reverse current over load.)

Connection cables requirement

The module is fitted with SMK Corporation connectors (CCT9901-2451F/CCT9901-2361F) which are mechanically and electrically compatible with Multi-Contact AG (PV-KST4/PV-KBT4) as of 7th April 2011. To extend the module connecting leads, only use Multi-Contact AG (PV-KST4/PV-KBT4), or SMK Corporation connectors under the same series.

3. WARNING

Do not stand or step on the PV module (Glass, Frame, Film and Terminal box).
For PV modules with anti-reflective coating glass (NU-R250J5, NU-R245J5, NU-R240J5), do not touch the glass since finger prints or stains will easily mark the glass. If dirt build-up becomes excessive, clean the glass surface with water only.

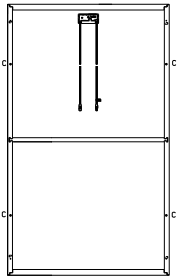


Figure 1

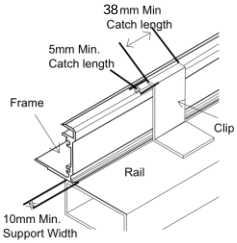
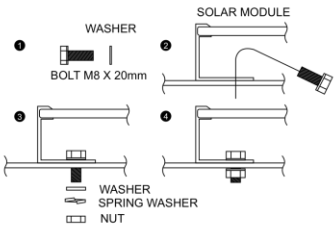


Figure 2

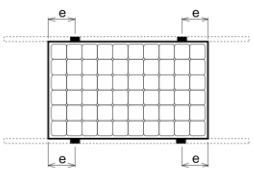


For your reference, please use the washer specified as below for the minimum requirement:

1) Spring washer
Material Stainless steel
Diameter M8 8.2/15.4mm
Thickness 2mm (reference value)

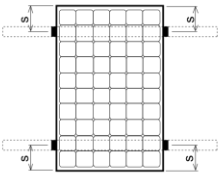
2) Washer
Material Stainless Steel
Diameter M8 8.5/15.5mm
Thickness 1.6mm (reference value)

Figure 3



150 mm< e < 410 mm

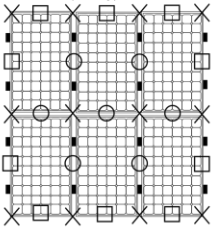
Figure 4



150 mm < s < 410 mm

Figure 5

(Withstand load capability)



○ : High (≦ 100kg)
□ : Middle (≦50kg)
╳ : Low

Figure 6

1. INSTALLATION

The mounting method has been verified by SHARP and NOT CERTIFIED by a third party organization. Please review the descriptions and drawings carefully; not mounting the modules according to one of these methods may void your guaranty. These mounting methods are designed to allow module loading of 2400Pa.

Mounting Using Frame Bolt Holes (Figures 1 & 3)

The modules may be fastened to a support using the bolt holes in the bottom of the frames at location "C", as shown in Figure 1 (back view of the module) and Figure 3 (mounting detail). The module should be fastened with four (4) M8 bolts.

Mounting Using Clips on Long Edge of Module:
Long Edge Parallel to Array Rails (Figure 4)

The modules may be mounted using clips (clamps) designed for solar modules as shown in Figures 2 and 4. Note that the clip positions are important – the clip centerlines must be between 110mm and 370mm from the end of the module.
The module must be supported along the length of the long edge, and should overlap the array rail by at least 10mm. Note that the mounting clips should meet the minimum dimensions (catch width of 5mm and length of 38mm) as shown in Figure 2. The array rails must support the bottom of the frames and must be continuous pieces (no breaks in the rail).

Mounting Using Clips on Long Edge of Module:
Long Edge Perpendicular to Array Rails (Figure 5)

The modules may also be mounted using clips on the long sides of the module when the array rails are perpendicular to the long sides, as shown in Figure 5. The clip centerlines must be between 110mm and 370mm from the ends of the module. Note that the mounting clips should meet the minimum dimensions (catch width of 5mm and length of 38mm) shown in Figure 2. The array rails must support the bottom of the frames and must be continuous pieces (no breaks in the rail).

2. ELECTRICAL INSTALLATION INSTRUCTION

Cable characteristics

Conductor size: 4.0mm^2, Cable type: XLPE cable (CE cable)
Maximum DC voltage: 1.8kV
Ambient temperature: -40°C to +90°C,
Maximum conductor temperature: 120 °C

Module configuration (Recommend)

Maximum series configuration: please refer to Table 1 (This value is calculated under the condition of Voc at -40°C.)
Maximum parallel configuration: (Parallel connection of each string shall be conducted with following two options. Any other parallel connections are prohibited.)
a) Case of using the diodes; 1 diode per maximum 2 parallel strings (Connect a diode or more in series for every string or every 2 parallel strings for protection of module from reverse current over load.)
b) Case of using the fuses; 1 fuse per every string (Connect a fuse for every single string for protection of module from reverse current over load.)

Connection cables requirement

The module is fitted with SMK Corporation connectors (CCT9901-2451F/CCT9901-2361F) which are mechanically and electrically compatible with Multi-Contact AG (PV-KST4/PV-KBT4) as of 7th April 2011. To extend the module connecting leads, only use Multi-Contact AG (PV-KST4/PV-KBT4), or SMK Corporation connectors under the same series.

3. WARNING

Do not stand or step on the PV module (Glass, Frame, Film and Terminal box).

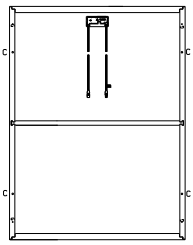


Figure 1

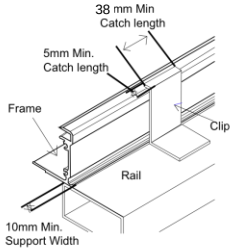
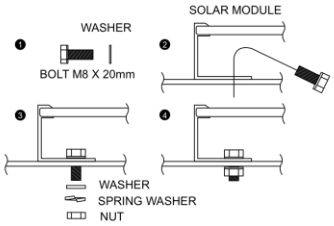


Figure 2

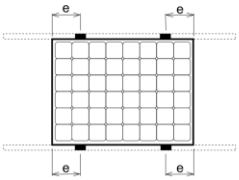


For your reference, please use the washer specified as below for the minimum requirement:

1) Spring washer
Material Stainless steel
Diameter M8 8.2/15.4mm
Thickness 2mm (reference value)

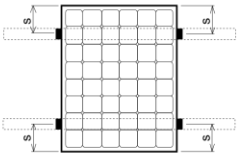
2) Washer
Material Stainless Steel
Diameter M8 8.5/15.5mm
Thickness 1.6mm (reference value)

Figure 3



110 mm < e < 370 mm

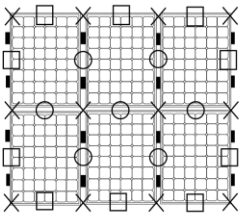
Figure 4



110 mm < s < 370 mm

Figure 5

(Withstand load capability)



○ : High (≦ 100kg)
□ : Middle (≦50kg)
╳ : Low

Figure 6

ELECTRICAL OUTPUT AND THERMAL CHARACTERISTICS
Rated electrical characteristics of Isc, Voc, are within ±10 percent of the indicated values and +5/-0 percent of Pmax (power measurement tolerance: ± 3%), under STC (standard test conditions) (irradiance of 1000 W/m^2, AM 1.5 spectrum, and a cell temperature of 25 °C (77°F)).

Table-1. Electrical characteristics (at STC)

Model name	Maximum Power (Pmax)	Tolerance	Open-Circuit Voltage (Voc)	Short-Circuit Current (Isc)	Voltage at Point of Max. Power (Vmpp)	Current at Point of Max. Power (Impp)	Maximum system voltage	Over-current protection	Application class	Maximum series configuration (*)
ND-R240A2	240 W	+5%/-0%	37.2	8.52	30.4	7.90	1000 V	15 A	A	21
ND-R235A2	235 W	+5%/-0%	37.1	8.38	30.4	7.74	1000 V	15 A	A	21
ND-R230A2	230 W	+5%/-0%	37.0	8.24	30.3	7.60	1000 V	15 A	A	21
ND-R225A2	225 W	+5%/-0%	36.9	8.10	30.3	7.43	1000 V	15 A	A	21
ND-R220A2	220 W	+5%/-0%	36.8	7.96	30.2	7.29	1000 V	15 A	A	21
ND-R215A2	215 W	+5%/-0%	36.7	7.82	30.2	7.13	1000 V	15 A	A	21
ND-R210A2	210 W	+5%/-0%	36.6	7.68	30.1	6.98	1000 V	15 A	A	22
ND-235R1J	235 W	+5%/-0%	36.7	8.44	29.8	7.89	1000 V	15 A	A	21
ND-230R1J	230 W	+5%/-0%	36.6	8.36	29.5	7.80	1000 V	15 A	A	22
ND-225R1J	225 W	+5%/-0%	36.6	8.28	29.3	7.68	1000 V	15 A	A	22
ND-220R1J	220 W	+5%/-0%	36.5	8.20	29.2	7.54	1000 V	15 A	A	22
ND-215R1J	215 W	+5%/-0%	36.5	8.12	29.0	7.42	1000 V	15 A	A	22
ND-210R1J	210 W	+5%/-0%	36.4	8.03	28.8	7.30	1000 V	15 A	A	22
NU-R250J5	250 W	+5%/-0%	37.9	8.76	31.0	8.07	1000 V	15 A	A	21
NU-R245J5	245 W	+5%/-0%	37.5	8.73	30.5	8.04	1000 V	15 A	A	21
NU-R240J5	240 W	+5%/-0%	37.3	8.63	30.2	7.95	1000 V	15 A	A	21
NU-235R1H	235 W	+5%/-0%	37.9	8.49	30.3	7.76	1000 V	15 A	A	21
NU-230R1H	230 W	+5%/-0%	37.7	8.43	30.0	7.67	1000 V	15 A	A	21
NU-225R1H	225 W	+5%/-0%	37.5	8.37	29.7	7.58	1000 V	15 A	A	21
NU-220R1H	220 W	+5%/-0%	37.3	8.31	29.4	7.49	1000 V	15 A	A	21
NU-185R1H	185 W	+5%/-0%	30.2	8.54	24.0	7.71	1000 V	15 A	A	26
NU-180R1H	180 W	+5%/-0%	30.0	8.37	23.7	7.60	1000 V	15 A	A	27
NU-175R1H	175 W	+5%/-0%	29.8	8.29	23.2	7.55	1000 V	15 A	A	27

(*) The maximum series number of modules depends on the local conditions. These values are calculated under the condition of Voc at -40 °C.

Under normal conditions, a photovoltaic module is likely to experience conditions that produce more current and/or voltage than reported at Standard Test Conditions. Accordingly, the values of Isc and Voc marked on this module should be multiplied by a factor of 1.25 when determining component voltage ratings, conductor capacities, fuse sizes and size of controls connected to the module output.

Application Class
This module is rated as “Application class A” according to IEC61730.

“Application class A” means:
General access, hazardous voltage, hazardous power applications
Modules rated for use in this application class may be used in systems operating at greater than 50 V DC or 240 W, where general contact access is anticipated. Modules qualified as application class A in IEC 61730 are considered to meet the requirements for safety class II.

FIRE RATING
This module is rated as “Fire safety class C” according to IEC61730.